



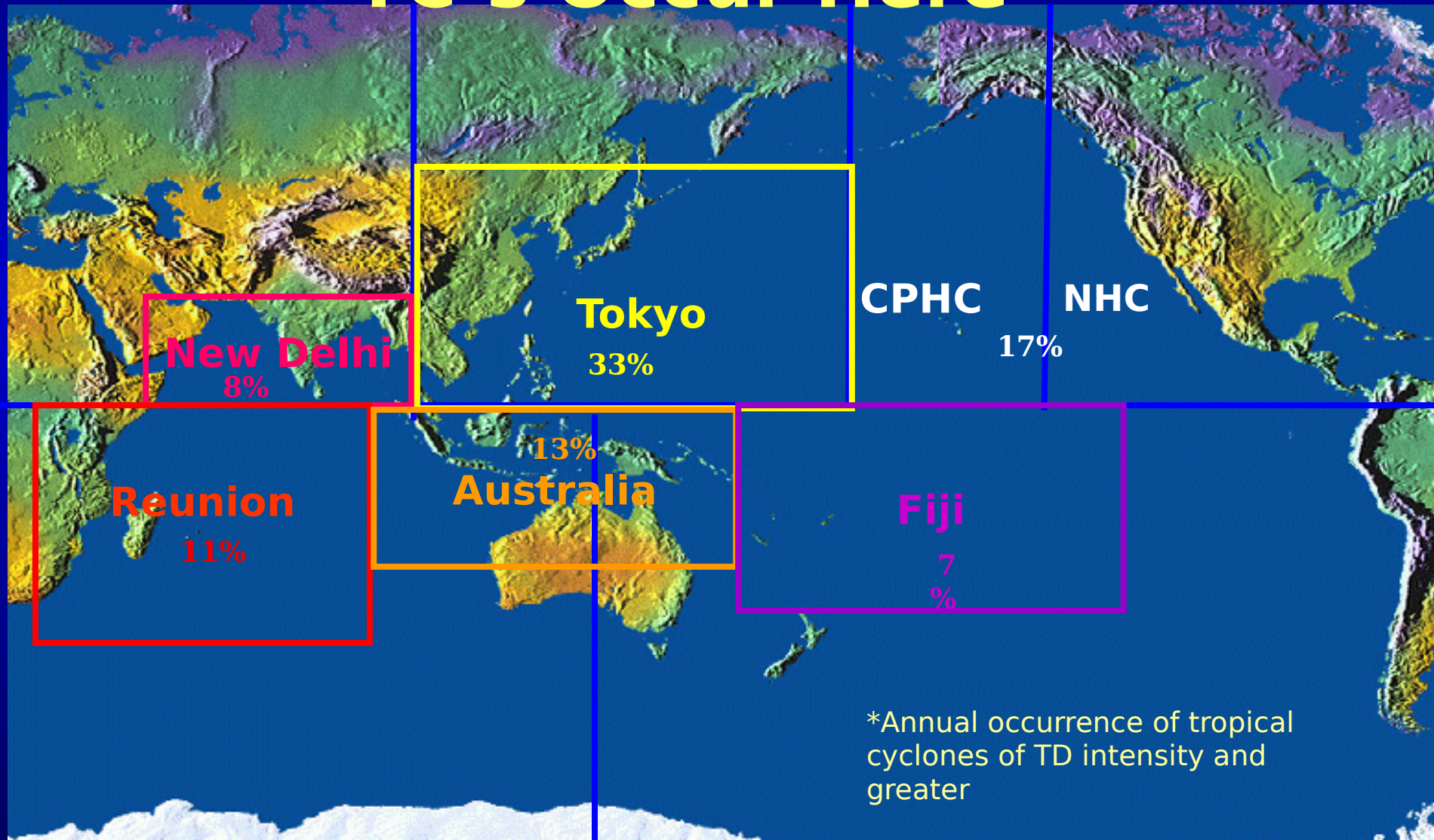
JTWC Inter-Agency & International Operational Collaborations

Edward M. Fukada
Technical Adviser
JTWC



JTWC AOR...

More than 85% of the TC's Occur Here*





Summary

- Given the extensive (areal) scope of JTWC responsibilities and low manning allotment, maximum effort have been and is being made to utilize all available data or forecast aids made available or developed by U.S. and international TC forecast organizations.
- JTWC has and is trying to collaborate with these organizations for the mutual development of forecast capability.



Summary (cont'd)

- Current collaborations focus on optimizing the CONSENSUS or multi-model forecast approach utilized by JTWC
 - Increase the number of skilled models used in the CONSENSUS
- Current collaborations also being conducted to improve JTWC analysis; get more data.
 - More obs (meso networks, ship, oil platforms, etc.)
 - More fixes (e.g. radar, metsat)



Background

- JTWC has a long history of interaction and collaborations with other TC forecast centers.
 - 1970's; Royal Hong Kong Observatory, Taiwan Central Weather Bureau, Philippine Atmospheric, Geophysical & Astronomical Services Administration as well as the U. S. NWS.
- With the rise or increase of the WMO RSMC organization, JTWC participation with these agencies have become less visible (informal)
 - JTWC has formal (direct & public) relations with NWS (per National Hurricane Operations Plan)
 - JTWC has formal relations with Australia Bureau of Meteorology under mutual defense treaty umbrella.



JTWC Contributions



- Presentations and discussion during annual WESTPAC visit; during the JTWC Roadshow
 - JMA
 - KMA
 - ROKAF
 - JASDF
 - JMSDF
- Data (forecasts, fixes, model output) made available via PZAL server/COLLAB site
 - Best track data
 - Forecasts; graphic & text
 - Fixes
 - Numerical TC forecasts
 - Wind probabilities



JTWC “COLLAB” Data Site



- Users

- Australia BoM
- Fiji Met Service
- Jakarta TCWC
- JPL/NASA
- Meteo-France, RSMC Reunion
- NAVPGSCOL
- NOAA Hurricane Rsch Div
- PAGASA
- Taiwan CWB
- University of Miami
- Vanuatu Met Service
- WFO Tiyan
- 1st MAW G-2 METOC
- 17 OVS
- 18 OSS/OSW
- 51 OSS/OSW
- 374 OSS
- AFSOUTH Wx (612 SPTS/WXO)
 - AFWA 2 WXG
- MCAS Futenma
- NOAC Yokosuka
 - NOOC
- USPACOM J56
- USS Theodore Roosevelt CVN 71

- Site future unknown; need for public-facing, password protected data site being questioned



JTWC “Partners” and Results WESTPAC



- Japan Meteorological Agency/RSMC Tokyo
 - Understanding of DVORAK technique differences
 - JGSM model understanding
- Korea Meteorological Administration
 - Numerical TC forecast tracks from KMA barotropic, global spectral and mesoscale models
- Taiwan Central Weather Bureau
 - Real-time radar fixes emailed to JTWC
 - DOTSTAR (aircraft recon) data emailed to JTWC



JTWC “Partners” and Results

Southern Hemisphere

- Australia Bureau of Meteorology (Brisbane, Darwin, Perth)
 - Email of DVORAK fix data to JTWC
 - Email of TCLAPS TC forecast track to JTWC
 - Routine phone & email discussion of TC suspect areas
- Fiji Meteorological Service
 - Email discussion of TC suspect areas
- Meteo France/RSMC La Reunion
 - Numerical TC forecast
 - Radar data
 - Email discussion of TC suspect areas



JTWC National Collaborations



[28th Conference on Hurricanes and Tropical Meteorology](#)

14A.4

A Statistical Analysis of JTWC NWPAC Intensity Trends

Stephen J. Barlow, 17th Operational Weather Squadron/Joint Typhoon Warning Center, Pearl Harbor, HI

A statistical analysis of observed Northwestern Pacific tropical cyclone (TC) intensity trends was completed using Joint Typhoon Warning Center (JTWC) best track data. The results of this analysis will be presented. This initial effort and follow-on work will be used in our continuing effort to improve intensity forecasts. Preliminary results indicate that there is no significant correlation between JTWC intensity forecast error and geographical location of the TC, initial TC intensity, or TC motion. However, this 30-year climatology can serve to help bound the intensity forecast problem.

[Extended Abstract \(548K\)](#)

[Session 14A, Tropical Cyclone Intensity Change I: Observational and Theoretical Studies](#)
Thursday, 1 May 2008, 10:15 AM-12:00 PM, Palms GF

[Previous paper](#) [Next paper](#)

[Browse or search entire meeting](#)

[AMS Home Page](#)



- JHT Home
- Terms of Reference (PDF)
- Staff
- Steering Committee
- Main Activities
- Highlights - 2001 to present
- New Projects (2007-2009)
- Past Projects
- Administrative Presentations and Information

JHT Steering Committee

[Current \(2008\) Steering Committee Members](#)

Ed Fukada	Joint Typhoon Warning Center
John Gamache	Co-chair - Hurricane Research Division
Jeff Hawkins	Naval Research Laboratory
Ed Rappaport	Co-chair - TPC/National Hurricane Center
Liz Ritchie	University of Arizona
Naomi Surgi	Environmental Modeling Center, NCEP
Hugh Willoughby	Florida International University

[Former Steering Committee Members](#)

Kerry Emanuel	(2002-2003) Massachusetts Institute of Technology
John Molinari	(2002-2003 Co-chair) - State University of New York, Albany
Russ Elsberry	(2002-2005) - Naval Postgraduate School
Frank Marks	(2002-2005) - Hurricane Research Division
Chris Landsea	(2005) - Hurricane Research Division
Bill Frank	(2004-2007 Co-chair) - Pennsylvania State University

Interdepartmental Hurricane Conference
 - Due to illness, RDML Titley was unable to attend. His Deputy, Mr. Ed Gough, was a last minute replacement and stressed that the Navy's "Battlespace on Demand" vision relies on high quality tropical forecasts. He mentioned that Navy METOC is a small organization and therefore relies on collaboration and partnerships. He emphasized the importance of the 3-5 day TC forecasts as well as the value of the JTWC partnership. The Navy remains committed to excellence in meteorology and emphasized continued cooperation in TC research and operations.

Summary Report

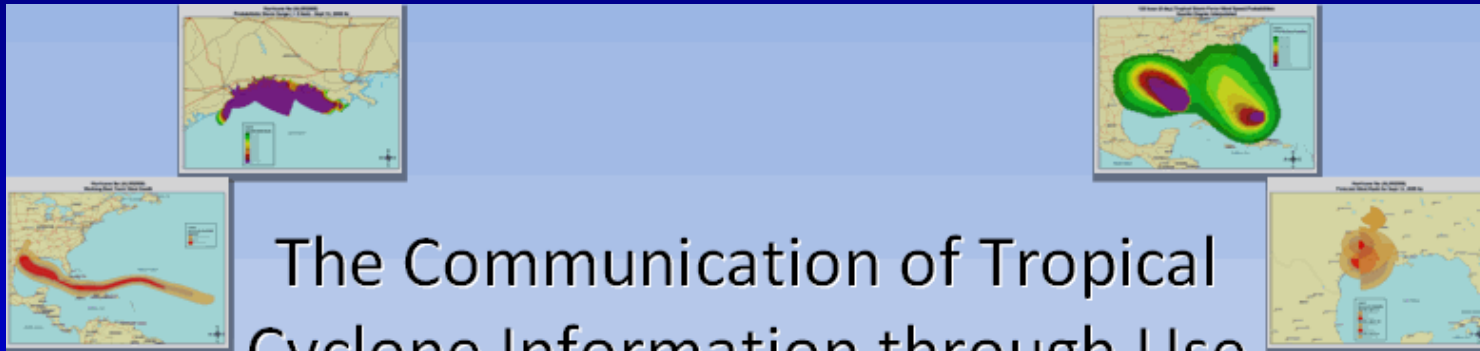
Excerpt from 63rd IHC

NPOESS/GOES-R/COMET Training Resource Development Workshop/Conference





Main Interagency Collaboration Tool: ATCF



The Communication of Tropical Cyclone Information through Use of Geographic Information System (GIS) Products

Alison Krautkramer¹, Christopher Sisko¹,
Christopher Lauer¹, Charles Sampson²,
Ann Schrader² and Edward Fukada³



¹National Hurricane Center (NWS/NOAA) Miami, FL
²Naval Research Laboratory (USN/SAIC) Monterey, CA
³Joint Typhoon Warning Center (NMFC/USN) Pearl Harbor, HI





Main Interagency Collaboration Tool: ATCF



- Forecaster Aids (GPCE-AX & P-LRFS)
- Developed for NHC & JTWC Under JHT
- Requirement determined through routine collaboration between NHC & JTWC

Conclusions

- GPCE-AX is an improvement over GPCE for CONU.
- GPCE-AX produces nearly identical results to GPCE for CONW.
- P-LRFS is reliable for CONU.
- P-LRFS is unreliable for CONW.
- ATCF implementation is underway.



JMA/RSMC Tokyo Mar 2008 Visit to NMFC/JTWC



- JTWC visited by Mr. Kenji Kishimoto, RSMC Tokyo forecaster, and Mr. Yoshiro Tanaka, JMA Office of Int'l Affairs Scientific Officer
- JTWC has informally visited RSMC Tokyo for over 10 years and has always extended invitation to JMA to visit JTWC.
- Early 08, email received from RSMC Tokyo, head, Mr. Kiichi Sasaki expressing interest in visiting JTWC.
- Subsequent emails coordinated visit (2 days; 13 & 14 Mar) with official reason - RSMC Tokyo visit to RSMC Honolulu with side visit to JTWC.

Dear Fukada-san,

We would like to thank all JTWC staffs, especially you, Mr. Michael Vancas and Ms. Kathryn Payne, so much for sparing time for our technical visit.

This visit made us understand the JTWC operations better than before.

In addition, I was very glad to participate in METCON. A briefing by staffs was so sophisticated.

If it was in active tropical cyclone's situation, we should have got many things to be discussed with staffs.

.....Finally, let us express our heartfelt appreciation to you for your greatest consideration to our stay in Honolulu.

We wish good health and success to you and the other JTWC staffs.

Sincerely yours,

Kenji KISHIMOTO

RSMC Tokyo-Typhoon Center



Vietnam Collaboration



- Based upon request to PACOM from Vietnam, JTWC warnings have been made available to Vietnam via email send and server (NRL GODAE) retrieval
- This collaboration or support initiated as directed by PACOM in support of Theater Security engagement efforts.

JTWC Team,

Below email from USPACOM Senior METOC Officer contains "thanks" for the hard work you do on daily basis. A recent Vietnam delegation stated their governments ability to accurately warn their people about tropical cyclones is dependent on your forecasts! It goes on to say your efforts are also helping improve relations between the USPACOM and Vietnam military.

Great job! Keep up the great work.

Lt Col Falvey

-----Original Message-----

From: Schulz, William J CAPT PACOM, J3319

Sent: Friday, September 19, 2008 11:28

To: Cooper, Grant A CAPT NMFC_JTWC, Commanding Officer

Cc: Schwingshaki, Ken CAPT NOOC, TSC/Plans; Lott, Steven A CAPT PACOM, J33; Lacy, Mark B Lt Col PACOM, J52; Ireton, Greg S CDR NMFC_JTWC, Executive Officer; Falvey, Robert LtCol NMFC_JTWC

Subject: Vietnamese Tropical Cyclone Warnings

Grant -

In their statements at the Bilateral Defense Discussions yesterday, the Vietnam delegation made a point of officially conveying their appreciation for these warnings. They stated that their ability to convey accurate warnings to the people of Vietnam has increased because of these, and they hope that these warnings will continue to be sent. The delegation also promised to check with the Vietnam weather service and Vietnam Navy to see if those organizations could provide us with some meteorological feedback on these warnings.

This has been a very big hit with the Vietnamese, and thereby a positive force in PACOM's increasingly improving relationship with the Vietnam military. Thanks very much for keeping these going.

•vr/Bill



JTWC Visits To KMA



- Ongoing since 1999
- Informal assistance and counsel provided for development of the National Typhoon Center
- Visits conducted during the annual JTWC Roadshow





KMA Invitation To Visit

2009 TCC presentation



Aloha Edward,

I hope that things are well with you. I am very pleased to inform to you that National Typhoon Center (NTC) have launched official since 21 April 2008. Please refered the attached file.

I understand that you would be busy. However I wonder if you and Lieutenant Colonel Robert Falvey could visit us in Jeju for couple of days during 1st week of March 3rd week of May this year.

I would like to invite you and Lieutenant Colonel Robert Falvey at National Typhoon Center(NTC) for introducing our current status and to receive advice on operational forecast at JTWC and many scientific issues. On that occasion, Many Prof's and researchers are also interested in inviting you.

All the travelling expenses will be borne at National Typhoon Center. It would be greatly appreciated if you let me know on our proposal.

With warm regards.

Eun-Jeong CHA

Senior Research Scientist, Deputy Director

National Typhoon Center

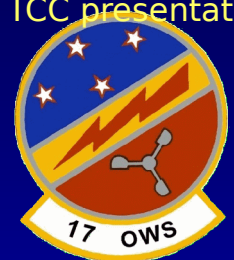
Korea Meteorological Administration

76-2 Hannam-ri, Namwon-eup, Seogwipo, Jeju 697-942

Korea (Rep. of)

+82-64-801-0241

+82-64-805-0366 (fax)



JTWC Attendance of the Annual ESCAP/WMO Typhoon Committee

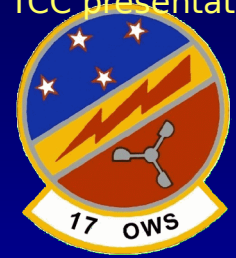






2008 ESCAP/WMO Meeting Chiang Mai, Thailand





Personal CWB Visit

Welcome Ed. Fukada
visit Central Weather Bureau

Taipei, Taiwan

2007.11.27

CWB Track Ecst.

DECADE	Guidance	24hr Track error	Improving Rate
1970s	Statistics model CLIPER, Human, PC, Analog	180 KM	0.2%
1980s	Simple NWP Barotropical model, SEMI_DYNAMICS	176 KM	0.68%
1990s	PE model LFS, GFS	164 KM	1.1%
2000s ₍₂₀₀₃₎	Data and Ensemble MULTI-MODEL ENSEMBLE	146 KM	??

2006 Track forecast error in western North Pacific (Homo. Comparison 1/1~12/10)

	24-h	48-h	72-h
CWB	102	194	304
JMA (RJTD)	106	195	280
USA (PGTW)	105	187	292
CMA ()	124	216	312

KM

Case number in 24/48/72-h 376、304、237

CWB Weather Forecast Center

Goal

Data

Receiving
Integration
Products

Platform

Upgrade
Uniform
Maintainers

SOP

Forecast Procedure
Decision Making
Collaboration

Science

State of art
Integration



Collaboration Results



- Increase in numerical TC forecast for CONSENSUS forecasting
- Increase data for analyses
- Utilize existing programs to improve TC forecast capabilities
 - JHT
- Establish strategic relationships that can be utilized to improve JTWC efforts, if/when capabilities improve.



PAU (Hawaiian = finished)

Questions?